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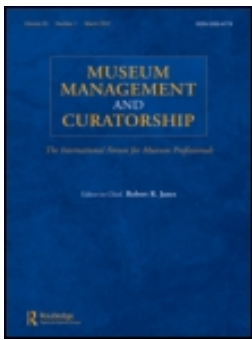
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Natural history museums as *provocateurs* for dialogue and debate

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Interpretation in natural history museums is generally conservative with methods of collections interpretation barely changed since the first natural history museums were founded. For all the changes undertaken by museums in the last 20 years, sector leaders such as the American Museum of Natural History, the Natural History Museum, London, the National Museum, Prague, Museum für Naturkunde, Berlin and the Muséum national d'Histoire naturelle, Paris still operate by connecting objects with facts about their biology. The recent relocation of the Grant Museum of Zoology at University College London has offered the opportunity for the museum to become a space for dialogue and experimentation.

The museum, in collaboration with the university, has developed 'social interpretation' designed to engage visitors with controversial questions in life sciences and museum practice. Visitor responses are recorded and used as the basis to plan future work.

The paper explores how this form of engagement with visitors might allow natural history museums to add to established methods of interpretation, and – in a form of co-production with their visitors – challenge attitudes to scientific knowledge and its development. Thus, the way natural history museums function as sources of knowledge for the public and the 'front line' of biological engagement is potentially changed, based on the responses of museum visitors.

Keywords: interpretation; participation; engagement; collaboration; digital interactive labels; iPad; natural history museums

Introduction

For natural history museums to challenge visitors' attitudes to natural science, and to become more relevant as public institutions as interpreters of science in society, they must confront issues around difficult subjects such as the human impact on the natural world, the ethics of collection, biological conservation and extinction. One way to do this is to break with the traditional empirical, authoritative and apolitical conventions of museum interpretation. In July 2010 the Grant Museum of Zoology at University College London (UCL) closed its doors to visitors to relocate to much grander and larger premises (for background on the relocation see Carnall and McEnroe 2011) (Figure 1). This relocation provided an opportunity for the Grant to make a transition as regards its interpretation, providing a means for the public to engage with natural science issues in innovative ways.

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One of the many advantages of the new museum premises was the increase in space to display objects. In the previous location the displays had the air of a Victorian cabinet of curiosity, a dense and imposing cornucopia of objects crammed into a small space. Museum staff were keen to maintain something of this atmosphere, as visitors had repeatedly commented that this was how a natural history museum should be. But one major downside to such a condensed display was that there was almost no room for interpretation beyond the main taxonomic narrative. Only a handful of cases touched on the history of the collection, biodiversity and a spotlight on extinct and endangered animals.

One of the major goals of the relocation was to create physical and intellectual space for more than one interpretation scheme. Museum staff were also keen to review the purpose of a university zoological museum and in particular to ‘make it a vibrant place for experiment and dialogue by offering provocative, interactive and regularly changing displays’ (MacDonald and Ashby 2011). In an age of widespread threats to the natural world, staff really wanted to change the way that visitors interact with natural history through museums.

Interpretation and natural history museums

The predominant model of interpretation in natural history museums remains largely unchanged since their earliest iterations in an age of discovery and description. Exhibit elements are commonly composed of a handful of modalities of written labels, icons and objects sealed behind glass occasionally supplemented with images and interactives. One concession to changes in hermeneutic theory has been a shift from expert-level interpretation to more accessible use of language and interpretive layers, excluding the use of scientific terminology and jargon (Grey,



Figure 1. The central space in the new Grant Museum of Zoology, which opened in March 2011.

Note: The museum's activities and architecture were intended to encourage dialogue. ©UCL Grant Museum/Matt Clayton.

Gardom, and Booth 2006). For example, until 2000, the Grant Museum had no written interpretation beyond individual object labels with the binomial name of the specimen and taxonomy giving little information to visitors who were not well versed in taxonomy.

Even so the dominant layering systems in natural history museums follow scientific classification models with the top layer of interpretation defining a discipline (zoology, palaeontology, mineralogy), a middle grouping layer (fish, reptiles, carbon-based minerals) and a lower level highlighting the lowest units that make up those groups (a carp, a plesiosaur, graphite).

The majority of the systems will be arranged either by biological classification in zoology and botany (although geographical groupings are also very common) or time in geology and palaeontology. Individual objects in natural history museums are interpreted tokenistically, out of a necessity to attempt to be comprehensive – a difficult task with hundreds of distinct groups and millions of species. For example, a taxidermy platypus will most often be used as a token to represent all platypuses, all egg-laying mammals or all mammals. This philosophy is ingrained in the very language of natural history museums. They necessarily talk of ‘specimens’ rather than ‘objects’, reflecting that individual items in the collections represent examples of a type – each object is kept to represent a larger grouping – rather than stand-alone pieces without such a conceptual collective (Figure 2).

It is rare in natural history museums to find a specimen biographically interpreted, although this is changing, particularly with recent work by Samuel Alberti on object biographies for natural history specimens (Alberti 2005). Typically, individual specimen labels will present facts about the organism or group of organisms represented, and normally these will include geographical or ecological information, aspects of how they look and move, how they sustain themselves and, for extinct organisms, when they became extinct.



Figure 2. A section of the Carnivoran display case at the Grant Museum.

Note: This lion skeleton and the smaller specimens to the right are used here to represent the larger cat family. ©UCL Grant Museum/Matt Clayton.

Given that in a typical museum visit, a museum visitor will read and take in only a handful of museum labels (Serrell 1996, 125), it seems slightly absurd that visitors will come away from visiting a natural history museum with, at best, the accumulation of a scattering of disconnected facts typical of object-level interpretation. This is particularly incongruous with natural history given that there are a wide range of important and interesting topics which, as outward-facing scientific institutions, they are uniquely placed to address.

On a macro level, such topics might include the history of the Earth, evolution, extinction, the human impact on the natural world, the ethics of collection, biological conservation, climate change, science in society and the promotion of science education. From a more personal perspective, topics could include humans as animals; how the natural world is exploited for our benefit; who 'owns' nature, when nature and culture overlap and our responsibilities for the natural world if we are to continue 'sustaining' an ever growing population. Such topics fit perfectly within the cultural identity, cohesion and citizenship remit identified by political organisations responsible for keeping museums relevant to society (Campaign for Learning through Museums and Galleries 2006), so why is there a dearth of this kind of activity within natural history museums?

If natural history museums are to confront these issues, there needs to be a break with the traditional empirical, authoritative and apolitical conventions of interpretation. This is by no means a new idea in the wider museum world. Archaeological, social history and ethnographic museums have for many years explored ways in which voices from outside the museum can contribute to the presentation and interpretation of collections, most commonly through engagement with specific communities of interest. In the western world, because many collections were acquired as a result of colonialism, this has often involved engagement with source communities. This is not to say that natural history museums have distanced themselves from these initiatives, but such activities have been problematic.

Although natural history specimens are transformed into museum artefacts through processes of collection and preparation, there is often a disconnection between specimens and peoples, and resultant discussions around entitlement, ownership and custody. Because of this, when they are used in community engagement projects alongside a wider collection, natural history objects have tended to be referenced primarily as ethnographic objects. This can result in tokenistic interpretations, from a social rather than scientific angle. Two such examples are the *Dialogues between Nature and Culture* project at the Museo Nacional de Ciencias Naturales, Madrid, and the *Animals in Heaven and Earth* project at the Museum of Natural History of the University of Parma (Bodo, Gibbs, and Sani 2009). Dialogue projects such as these have – as part of an admission of historic cultural and institutional guilt – shifted their interpretation completely from an overtly scientific to an entirely social interpretation. There seems to be an assumption that the social and scientific categories can only coexist with one category as dominant and the other as marginalised or totally absent.

UCL Museums had previously worked on *Revisiting Collections* (Collections Link 2012), a project, replicated in many museums nationally, that involved museum curators working with a small group of people from communities with a potential stake in the material heritage present in the UCL collections. Following intensive work with this focus group, it had been intended to present their views on the

collection on museum labels, as well as including them as a permanent part of documentation in collection databases.

Many valuable lessons were learned as part of that process, but the project was very time intensive for staff and for the community group. The group also required a large amount of 'steering' to fit predefined outputs in the form of community-generated labels. In the resulting labels 'the voice' of the community had been condensed into a form that, when presented in the context of the carefully structured Grant Museum interpretation scheme, appeared somewhat inane. In addition, the intensity and short-term nature of the project and its funding created pressures, as has been the case with many well-intentioned community partnership programmes (Lynch 2011, 6).

Another common problem with community participation projects is that conversations and feedback often take place behind closed doors and are not widely available to future visitors or participants. What is more, inviting target audiences into focus groups and community panels to feed into practice, is necessarily exclusive, and such groups 'are forever permeated with the power effects of difference' (Lynch and Alberti 2010, 147). The fundamental idea of the 'community voice' is fraught with complexities including the subtle positioning of participants as clients, the assumption that a focus group can represent a coherent group and the nuances of how individuals operate differently in social activities (Cornwall 2004, 84).

With previous experiences in mind, Grant Museum staff did not just want to change the *status quo* of discussion and debate in natural history for the sake of innovation, but to use objects as a focus to positively and permanently change it. The specific aims of a new way of working were to empower visitors to scrutinise information in scientific museums, to highlight that there are areas of science without a clear, correct or incorrect interpretation, to politicise the museum, to give visitors a voice equivalent in status with that of the Museum, and to avoid creating a well-intentioned but ultimately exploitative method of working with an audience. There was also a strong desire to take natural history museums beyond the 'house of facts' mode of operation and into line with wider contemporary museum practice. The QRator (2011) programme offers the opportunity for 100 per cent of visitors, not just a subset, to feed into decisions, and for every contribution to be visible to future visitors and online users, circumventing to a certain extent the limited level of inclusion and agency which participation projects can present (Hickey and Mohan 2004).

The QRator project

From receiving the initial notice that the Grant Museum would be relocating, we and our colleagues began to conceive of desirable features for a new space that would enable the museum to work more strategically and efficiently within and beyond the university.

Initial discussions with the Director of Museums and Public Engagement, Sally MacDonald, centred around how multiple layers of static interpretation could be created within the museum to best serve our diverse audiences. Labels were written in an accessible way for the general public visitors but we were keen to be able to introduce 'smart labels' into the museum so that at a flick of a switch we could transform the interpretation layers into 'academic zoology mode' for our biology

students, ‘art history mode’ for visiting art classes or ‘animal love mode’ for a Valentine’s day event. The idea was that smart labels could cater to our different audiences without resorting to endlessly rewriting interpretation.

Coincidentally, at the same time as we were discussing smart labels, colleagues from Brunel University, Edinburgh College of Art, University of Dundee, University of Salford and UCL had just launched a project called *Tales of Things* (2010). The idea behind *Tales of Things* is that objects of all kinds can be tagged with QR codes, by anyone, and that anyone scanning that code can attach their own tale to that object (talesofthings.com). *Tales of Things* had just been launched and was being used in Oxfam stores, allowing users to leave their memories with things they donated. There seemed to be obvious applications in museums; not only would a QR code permit multiple narratives for objects but it would enable the introduction of text content longer than a 30-word label, for people who wanted a greater depth of interpretation.

Tales of Things also had the advantage that anyone (with a smart phone or Internet access) could add their tales to objects, creating visitor-generated interpretation. When used in a context where personal opinions and reflections are appropriate, it provided a seemingly straightforward way for anybody to add their voice to an object. Crucially for us, it provided a way to avoid the pitfalls of the aforementioned community projects – where selected voices were taken to represent a whole community. It also had the advantage that the process does not appear to demand large time commitments from museum staff or audiences. Following a chance encounter at a conference at which *Tales of Things* was being presented and Grant Museum staff were contributing, UCL Museums began to work with Claire Ross from UCL Digital Humanities and Dr Andrew Hudson-Smith from UCL Centre for Advanced Spatial Analysis (CASA), whose group was responsible for creating and rolling out *Tales of Things*.

A small pilot study was undertaken to focus on the use of this mobile technology in the context of the Grant Museum. Unfortunately, at that time the museum was only two weeks from closing for relocation but a two-week pilot was implemented to explore the practicalities of using this technology in a museum space. During this trial, visitors were encouraged to add their ‘tales’ to specific objects on permanent display. For a comprehensive report of this initial test case see Ross et al. (forthcoming).

After the pilot, and in discussion with colleagues from the academic departments involved, it was decided to adapt the *Tales of Things* software to create a new programme for the museum. The programme was given the name QRator.

Embarking on this project forced us to question the benefit of visitor-generated content, to those that produce it, to those that read it, and to the museum.

The Grant Museum Interpretation Strategy lists the interpretation aims as (in no order of priority) follows:

- (1) to increase people’s knowledge and understanding of the natural history of the collection and its animals by providing factual information about the collection and the topics it relates to;
- (2) to lead people to gain an increased appreciation for the natural world independent of factual information;
- (3) that people enjoy what they see and do, and explore the depths of the collection (Ashby 2005, 1–2).

The museum team was initially sceptical that visitors would generate content that would be interesting to others. Interpretation in the Grant goes through a fact-checking process before installation. Opening up object-specific content generation to visitors would make this impossible. It was anticipated that the majority of visitor contributions would be personal stories – recollections and opinions – rather than attempts to add factual content. In these respects, we felt that this process was unlikely to meet our first aim.

Visitors' contributions to object interpretation do have the potential to help realise our other two aims, but in order to do so, the contributions would have to be of sufficient general interest.

Following discussion, we devised a scheme with greater potential to benefit all three stakeholders (active contributors, passive readers and the museum). The idea of running multiple layers of interpretation on single objects was shelved. Instead, the focus of the project shifted to larger concepts and questions raised by the museum, with visitors contributing their thoughts. Digital screens – in the form of iPads – allowed visitors to join the conversation in the museum space. The iPads are located next to the exhibit cases (Figure 3) and pose provocative questions about museums, life sciences and natural history. The use of QR codes and Twitter integration allowed visitors with smart phones to 'take' the conversations – the questions and their responses – home with them, and all content was synced with the QRator website (www.qrator.org). *Tales of Things* and the bespoke QRator software made the content creation and moderation relatively easy for the museum staff.

Prelaunch considerations

We were somewhat hesitant to use computer technology in the museum. Museum interactives can fall into the trap of being over-engineered for the required purpose or used to replace better and cheaper modalities of interpretation for the sake of



Figure 3. One of the QRator iPads in front of a related display in the Grant Museum ©UCL Grant Museum/Kirsten Holst.

novelty. This has been demonstrated by recent interactives at exhibitions at the Natural History Museum, such as a skidoo game as part of the *Ice Station Antarctica* exhibition and the interactive gallery in the Darwin Centre Phase 2 (Carnall and Cook 2010). With QRator, however, the interactives were genuinely enabling a level of interpretation that could not otherwise be achieved.

Another of our concerns was that the mere presence of technology in the context of the very 'Victorian' museum would upset visitors familiar with the old museum. It could be seen as 'dumbing down', taking the focus away from the specimens and detracting from the special atmosphere that kept visitors coming back. Indeed, the most common comment visitors made on hearing that the museum was moving was 'Please don't change', normally with reference to a perceived trend of moving from object-dense galleries to minimalist sterile 'white cube' galleries.

Even though we wanted to change the way the museum operated, we were aware that we would be challenging preconceived expectations of a natural history museum. We wondered whether visitors would resent being asked questions in an environment which normally only presents answers.

The QRator project sought to explore the appropriate means of mediating the museum experience – space, object, narrative, users – via a handheld mobile device. The project team (museum staff and academics and developers from CASA and UCL Digital Humanities) was keen to devise questions for QRator that had the potential to change the way that the museum functioned. This was an experimental project and we were genuinely interested in visitor responses.

However, we had not reached a consensus on what kinds of visitor contributions were acceptable. As a baseline procedure for the first round of questions we decided that profanity and nonsense (e.g., 'asdfghjkl') would be moderated out but we left it open as to what else would and would not be moderated. The first round of questions was used as a test case to inform how moderation worked in the future. At this stage we had only very vague notions of how and where the outcomes of the project would be disseminated. Reports and conferences would make findings available to the sector but it was unclear how contributions and the resulting changes in the way the museum functioned would be presented to the visitors who contributed to the discussion. Because the modes of feedback had not been decided before the launch, visitors were not informed on how their contributions would be used, which raised some ethical issues.

The QRator project needed a framework for measuring success; however, that was predicated upon experimentation, monitoring and evaluation of audience reaction to the new approaches.

Launch and the first year

In March 2011 the Grant Museum reopened in its new location, the former UCL medical school library. In addition to better street-level access and a space twice the size of the previous museum, the QRator interactives were launched. There were 10 QRator displays with the idea being to change the questions and the associated displays every couple of months. When the cases were changed, past questions would remain active online at <http://www.qrator.org/past-questions/>. The first 10 questions written by museum staff were as follows:

- (1) Is finding a cure for the common cold more important than protecting Tasmanian devils from a contagious cancer which could see them extinct in 20 years?
- (2) What makes an animal British?
- (3) Do animals in zoos have any value for conservation?
- (4) How do we balance the needs of our specimens and the desires of our visitors?
- (5) Should human and animal remains be treated any differently in museums like this?
- (6) Can keeping pets be justified given their impact on wildlife?
- (7) Is it ever acceptable for museums to use replicas?
- (8) Should science shy away from studying biological differences between races?
- (9) Every medicinal drug you have ever taken was tested on animals. Is this a necessary evil?
- (10) What do we mean by platypus?

Each QRator case question has five levels of interpretation designed to make the topic clear and to communicate to audiences that their opinion is both valid and desired by the displays. The top level is an eye-catcher to pique curiosity and to introduce the topic, e.g., Better the Devil? (for Q1 above) or Conserve or Display? (for Q4 above). The next level is the main question as reproduced above. Next comes the background information that gives more context on the topic at hand. These are typically twice the length as a standard Grant Museum label (Figure 4). This element of interpretation was challenging to write as it needed to very succinctly provide an unbiased grounding in the question(s) at hand. For example, for the topic Captive or Conserved:

Do animals in zoos have any value for conservation? A major justification for keeping animals in zoos is that they serve to educate the public about environmental issues. 95% of animals in zoos aren't endangered and very few that are are part of European Captive Breeding Programmes. Can the remaining species act as ambassadors for the rare ones? Do zoos teach valuable lessons, and increase appreciation and respect for the natural world?

The next level of interpretation is a series of object labels in the physical displays, further illustrating the questions complementing the iPad content. Obviously, this content would not be available to audiences interacting exclusively online, so the other levels of interpretation had to function without being reliant on object labels:

DOLPHIN SKULL

Does a species' intelligence contribute to its suitability to being confined? Zoos have to work hard to keep some species stimulated.

LION SKULL

Some species are not very active or wide-ranging, making them more suitable to captivity. How do you balance the needs of visitors and animals?

The last layer of interpretation is the stream of comments from real visitors and virtual visitors, along with further contributions from Twitter; all tweets using the hashtag #GrantQR would appear on the Twitter comments page of the interface.

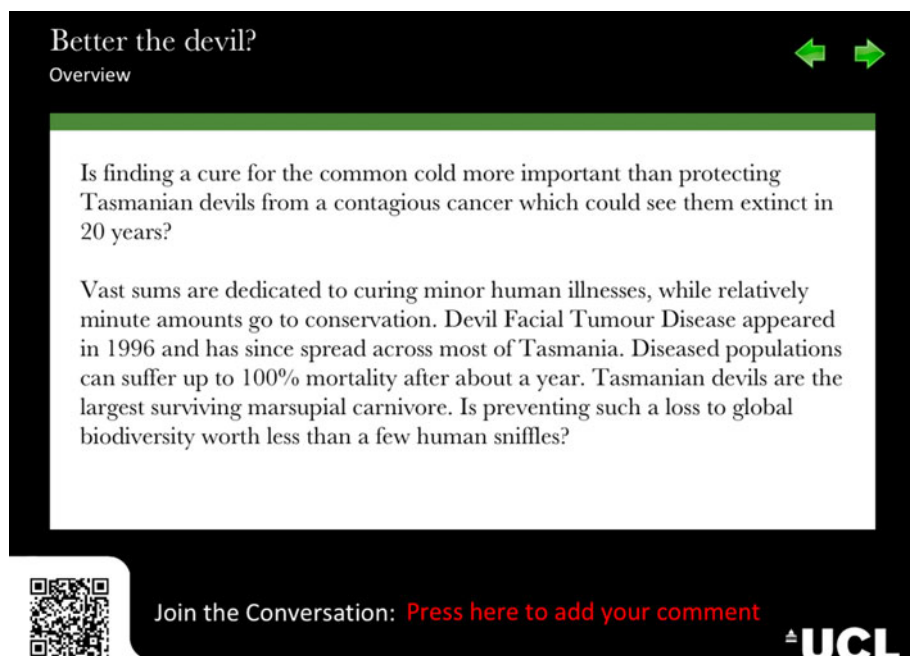


Figure 4. Screen grab from 'Better the Devil' question on an iPad, showing top-level headline, main question and background information.

In advance of the opening, the original plan had been to change the questions every two months. However, based on observations of use, such an intensive rate of update was judged to be unnecessary as questions remained actively used for the length of time they were displayed. The first set of questions ended up being live in the museum for between eight and nine months (and they remain active on the project website). Over this period, during which there were 9000 visitors to the museum, around 3000 unique contributions (excluding those post-moderated and removed by staff) were made in the museum space and remotely via Internet-enabled phones and computers.

What worked well

Outcome: visitors engaging with issues

The biggest positive outcome is that visitors are genuinely engaging with the questions that we have asked. Despite the significant opportunities for misuse offered by a post-moderated free-text anonymous digital text box, a huge number of the responses do offer opinionated answers to the questions. In total, around a third of all comments (after moderation) directly attempt to answer the question. Conversations between visitors in the museum are common, suggesting that visitors are inspired to share their own experiences, thus co-constructing multiple public interpretations of museum objects (Figure 5).

A greater number of the comments are extremely well considered. The questions are designed so that contributing does not require any prior knowledge, and will

often prompt thoughts that visitors may not have considered before, or come to take a stance on. One of the initial 10 questions – ‘Can pets be justified given their impact on wildlife?’ – did make it clear that the museum favoured one side of the argument. In this case the question raised an issue that is very rarely considered, and met with our aim of raising issues around environmental conservation. This particular question was also highlighted on a physical voting board, where visitors were asked to choose either pets or wildlife. Many people said that they chose both, and some others asked why they had to choose. In reply to such comments, many contributors made the point that the question was showing that you had to choose one or the other, as to choose pets was to going to destroy wildlife. It was clear from the conversations that this was a new issue for many visitors.

Outcome: visitors engaging with the museum and its specimens, off-topic

Some might argue that an average of 33 per cent on-topic comments is a low strike rate, but we at the Grant Museum do not take this view. First, it means that 33 per cent of the contributors have read at least one of the associated levels of interpretation, and we believe any museum interpreter would gladly take a 33 per cent read-rate.

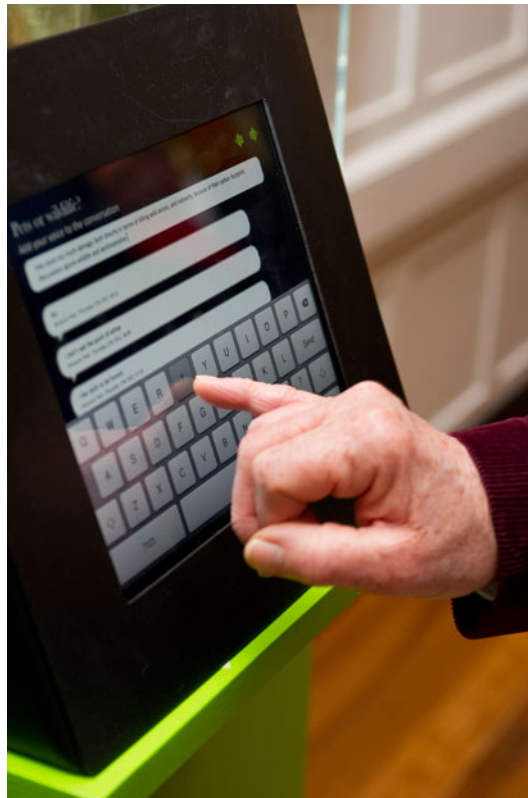


Figure 5. A visitor using the ‘Join the Conversation’ screen on a QRator iPad. ©UCL Grant Museum/Kirsten Holst.

Secondly, most of the other comments are significant in one of two ways. Visitors use the iPads, without instruction, to make comments about the museum in general, pointing out what they enjoyed about their visit or making other useful comments. As ‘digital visitor books’ they generate thousands more comments than our paper versions. This raises the question of whether a digital technology used in this way promotes an opportunity for visitors to make meaning from their whole museum experience, rather than engage with the exhibit-specific content and interpret the exhibitions themselves.

The other major comment group refers to specimens that visitors have seen and want to reference – often stating what they have learnt – or remark about something surprising they have seen. Visitors point each other to objects without the interference of museum staff – they choose in a very democratic way what they think should be highlighted. Both of these comment types provide evidence that all three of the interpretive aims stated above are being met.

Outcome: introducing new topics and participative interpretation models to natural history museums

As stated above, this brand of participative (rather than interactive) interpretation has yet to be adopted on the whole by the natural history museum sector. A major aim of QRator was to open up what can be said about zoological objects in a museum setting, and complement the existing interpretation around diet, habitat, conservation status and ecology. We feel that this has certainly been achieved. Using specimens not so much to represent a type, but to make a point aligned to an associated question, has allowed us and our visitors to see our collections differently. Staff in social, history and art collections long ago realised that their objects could and, more importantly, should spark debate and become talking points, rather than act as avatars of a fixed set of facts. QRator has introduced this concept to the Grant Museum.

The kinds of questions that are being asked, on the whole in an open-ended and non-leading manner, are uncommon in a natural history museum setting. This project demonstrates that the museum environment is conducive to wider discussions about the role of science in society. While none of the topics are out of place in a natural history museum, issues about the ethics of eco-tourism, zoos, cloning, domestication and resources for conservation, for example, have rarely been tackled by the sector, and where they have it has normally been in events, which give topics only an ephemeral focus and for a limited audience. Asking people to contribute to conversations on these issues in a scientific institution such as ours opens up to a wider public debates that are often restricted to specialist disciplines.

Many museums have been hesitant to open up communication to greater participation by visitors. The concept of trusting audiences and encouraging visitor participation in interpretation runs contrary to the traditional ideas of museum authority and communication (Lynch and Alberti 2010). There appears to be within the museum profession an ingrained fear that visitors will leave inappropriate comments when there is no moderation or intervention by the museum (Russo and Watkins 2005). This is despite research showing that museum visitors want to engage with complex, controversial topics by making comments or talking to staff and other visitors (Kelly 2006). Through the QRator project we feel that we have begun to

embrace the concept of ‘radical trust’ in the visitor community. The term ‘radical trust’ has been defined by Fichter (2006) as follows:

Radical trust is about trusting the community. We know that abuse can happen, but we trust (radically) that the community and participation will work. In the real world, we know that vandalism happens but we still put art and sculpture up in our parks. As an online community we come up with safeguards or mechanisms that help keep open contribution and participation working. (Fichter 2006)

This radical trust is based on the concept that shared authority is more effective at creating and guiding culture than institutional control. Inherent in the term is the suggestion of a previous lack of trust shown by museums towards visitors, but also the admission that such trust is regarded as new and somewhat dangerous. Radical trust as a concept, however, is not new, it is widely practiced online in user-generated content, especially by libraries (Lynch and Alberti 2010), and has been previously applied successfully to museum blogging (Spadaccini and Chan 2007). In practising radical trust, the museum does not control the final interpretation produced. The content is genuinely cocreated, representing the shared authority of a new interpretative narrative that continuously develops with each new audience contribution. The ‘radical’ is ultimately a belief in the prevalence of a calm community of participants as opposed to malevolent vandals who will misuse the opportunity. The QRator data suggest that ‘radical trust’ in visitors does indeed work: spamming and inappropriate commenting does not appear to have occurred to a significant extent.

By offering opportunities for visitors to consume and co-create digital interpretation, the Grant Museum has taken a proactive role in developing new narratives around museum collections, enabling direct experience of content production. There may be unanticipated consequences in relinquishing authority and utilising radical trust in this way, consequences that we cannot yet predict, but, by focusing on the positive the radically trusting museum has the potential to be part of the ‘participatory sphere’ (Cornwall and Coelho 2007, 8) where individuals can share experiences and participate on equal terms. QRator has provided a platform to help to discover visitor stories and experiences and share them with a wider audience, providing a broader, more personal interpretation of the Grant Museum collections. This new co-creation of interpretation has enabled us to highlight visitors’ active role in creating meaning of their own museum experience. Each visitor has their own agenda, identity, motivation and interests, and will approach the museum with different perspectives (Ross et al. forthcoming). As a result, visitors are able to share their own ‘digital stories’, narratives constructed from their own interpretation of museum collections.

Reflections on less successful issues

Historically, visitor participation projects have been criticised for a number of valid reasons (Lynch 2011 provides a summary). They include that they are ‘rubber stamp exercises’ in which participants experience ‘empowerment-lite’; that they are short-term; that they generate false consensus; that they use unrepresentative subgroups and that they are peripheral to key strategy work. QRator aimed to minimise such

biases (for example, by inviting 100 per cent of visitors to comment, and by making all their responses freely available), but ultimately we question the extent to which they can be eliminated. All these things rely on an element of trust being left with museum staff carrying out the dissemination or change of practice.

Have our visitors been empowered?

One of the major aims of the QRator project was to create a platform for our visitors to feed their opinions into our decision-making processes. Many of the questions relate to issues of museum management and how collections should be used. For example, one QRator question raised the ever-present issue of collections use (and potential degradation) vs. storage in perpetuity:

How do we balance the needs of our specimens and the desires of our visitors? Most objects on display are irreversibly damaged by exposure to light, dust and fluctuations in temperature and humidity. The longer they are on display the shorter they will last. Instead, specimens in storage will last longer without requiring conservation treatment and care; however, visitors would not be able to readily see the specimens. Without specimens there wouldn't be a museum.

Answers to this question will help us decide the extent to which we use stored collections in rotating displays, which is something we genuinely want to know from our visitors. Similarly, the question 'Is it ever acceptable for museums to use replicas' can help shape how we create displays and acquire objects for teaching and public engagement.

We receive a huge number of comments on questions like this, but are not convinced that the visitors realise that their input informs decisions that are made, despite signage in the museum communicating our intent – there is little guarantee that these are read. Do visitors realise it is the museum that is asking? One possibility is that visitors are used to thinking of the front of house staff as being cut off from how the 'real' museum works behind the scenes, and do not automatically think that they can feed into how things are run. Perhaps the abundance of shallow interactives has ruined the market for this new breed of social participative interpretation and it will take a while for the change to hit home.

Popular online social media platforms such as YouTube and news sites with comment facilities provide opportunities for individuals to make comments which, while visible to all, essentially disappear into the ether without encouraging any change in behaviour of the video or article creator. It is possible that visitors consider the comments they make on the QRator platforms to be equally ineffective.

When visitor contributions effect changes in the museum it will sometimes be easy to label them as such. In other instances it would be impossible to show. For example, if the outcome of the question above is that visitors think we should be using replicas in place of real specimens in a schools workshop, this will not be readily apparent.

Some of the questions we raise (for example, 'Should science shy away from studying biological differences between races') are not the ones where we can turn responses into direct action, except where they might frame future questions, exhibitions and exploratory events.

To be empowered, do visitors need to understand the changes they have effected, or is consideration of a new issue, a new perspective, empowerment enough?

Are we exploiting our visitors?

We intend, once the responses are collated, to summarise and publish them, but there is no clear mechanism for ensuring that the original comment-leavers will come across the results. We do not collect any data when visitors comment (as such an interface would be likely to result in a massive drop-off in volume, and remove the important anonymity), and so have no means to contact them.

Given that many of our visitors will not know that their responses are being used to make decisions, will they feel that they are being exploited?

Is it impossible to remove biases?

What happens when we disagree?

Cynical exercises in audience consultation can result in feedback that is ignored by the museums' decision-makers. With QRator, the data are all publicly available on the iPads while the question is live, and in perpetuity on qrator.org. However, it is hard to imagine that a member of the public will take the time to collate the answers to check whether or not the museum followed the consensus; the system is open but exploitable. In addition, the museum will need to make the final decisions on some topics, making it impossible to react to all visitors all of the time. In a simplified example, if 50 per cent of visitors consider it unacceptable to use replicas in museums and 50 per cent think replicas are fine, should the museum choose to go with one group or the other or try to achieve a balance? Is a statistical majority enough, or does it need to be a significant majority?

How do we interpret the data?

When the responses are collated, they are grouped into top-level categories such as 'Answering question – yes', 'Answering question – no', 'Comment about the museum', 'Comment about a specific object', 'Comment about animals in general' and 'Noise'.

Assigning comments to categories is extremely subjective as we must interpret meaning from a stand-alone statement.

What is noise?

Although all comments, excluding expletives, go live at the time of writing, museum staff delete irrelevant 'noise' later based on their interpretation. In some cases this is straightforward, while in others it is challenging. For example, the comment 'I like Chinese food' could be considered inane babble for deletion, or it could be a relevant tangent to a conversation about the use of wildlife products in Traditional Chinese Medicine.

The future

In terms of physical outcomes we envisage publishing the feedback to each question for the wider museums sector, particularly for colleagues in scientific museums. Depending on the potential audience for each individual question, platforms for dissemination could include sector-specific journal articles, public events, blog posts, press releases or more internal communications.

We need to find ways of communicating what changes in practice, or what decisions have been influenced by visitors' responses on QRator, as this could influence the way people engage with the process, as described above. The *New Media Consortium Horizon Report: 2011 Museum Edition* (Johnson, Adams, and Witchey 2011) cited QRator as being four to five years ahead of 'the adoption horizon' for the sector as a whole, which is a promising outlook, and the project won the 2012 *Innovations Award* at the Museums and Heritage Awards for Excellence.

The QRator team is extremely interested in influencing the museum sector to experiment with similar products, and is exploring the possibility of commercialising the product to sell to other museums. Many institutions from around the world have been in contact with the team to ask about the technology and the participative principles and we are hopeful that the model may be adopted more widely.

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